



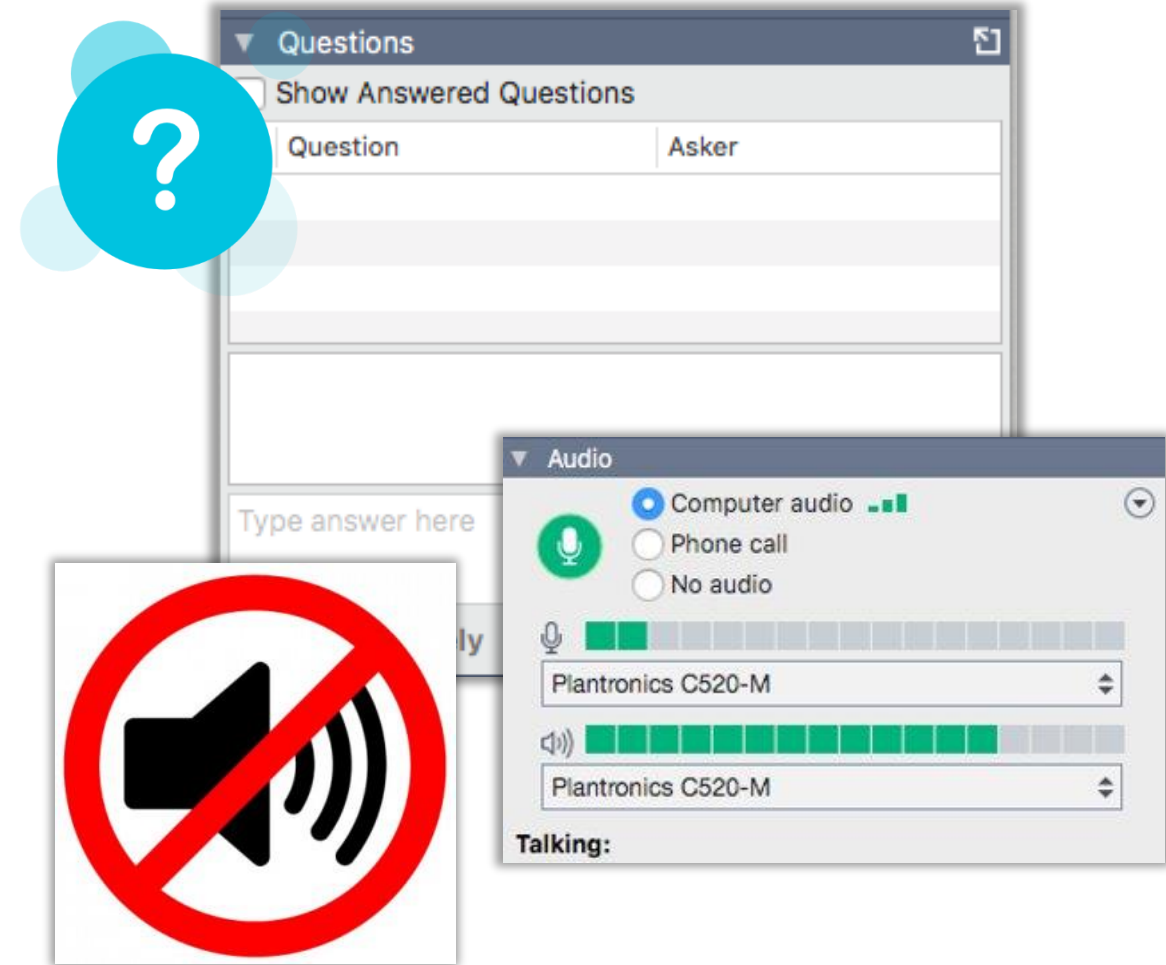
Progress® |  kemp

High Availability: Introductie van LoadMaster

PART III

Huisregels

- Kunt u ons niet horen? Probeer dan verbinding te maken met computer audio, niet met de audio van uw telefoon.
- Vragen? Gebruik de *question panel* aan de rechterkant van uw scherm.
- Opnemen? De sessie wordt opgenomen.



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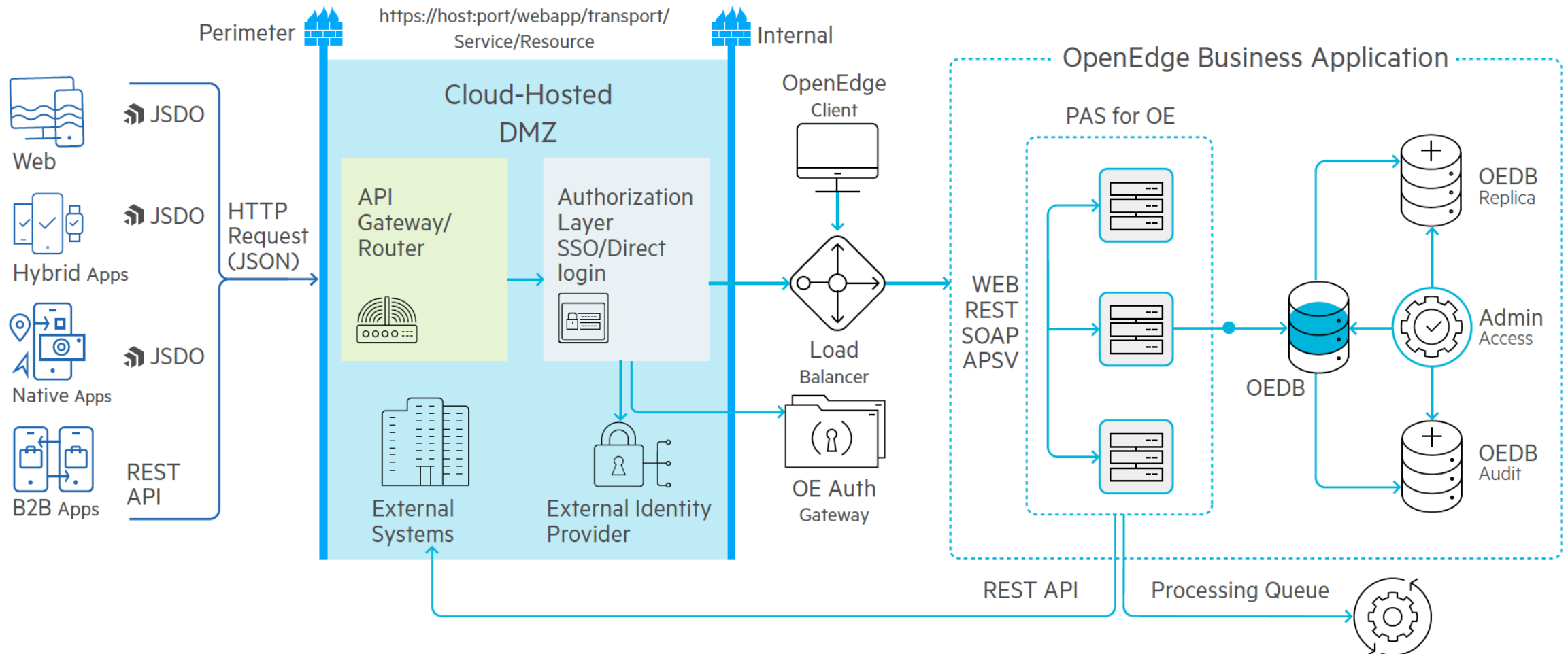
Agenda

- Load Balancing in OE omgeving
- Introductie LoadMaster
- Demo



Load Balancing in een OpenEdge omgeving

Reference Architecture for Cloud Deployment





Introductie LoadMaster

LoadMaster (ADC)

- ❖ Enhance the Application Experience (AX)
- ❖ Software-based solution – With virtual, bare metal, hardware, and cloud offerings
- ❖ Focused on load balancing – While offering WAF and authentication as an integrated solution
- ❖ Most use cases requiring an ADC are actually looking for a load balancer

Provide invisible technology with a visible impact, making it easy for our customers to power an always-on application experience.

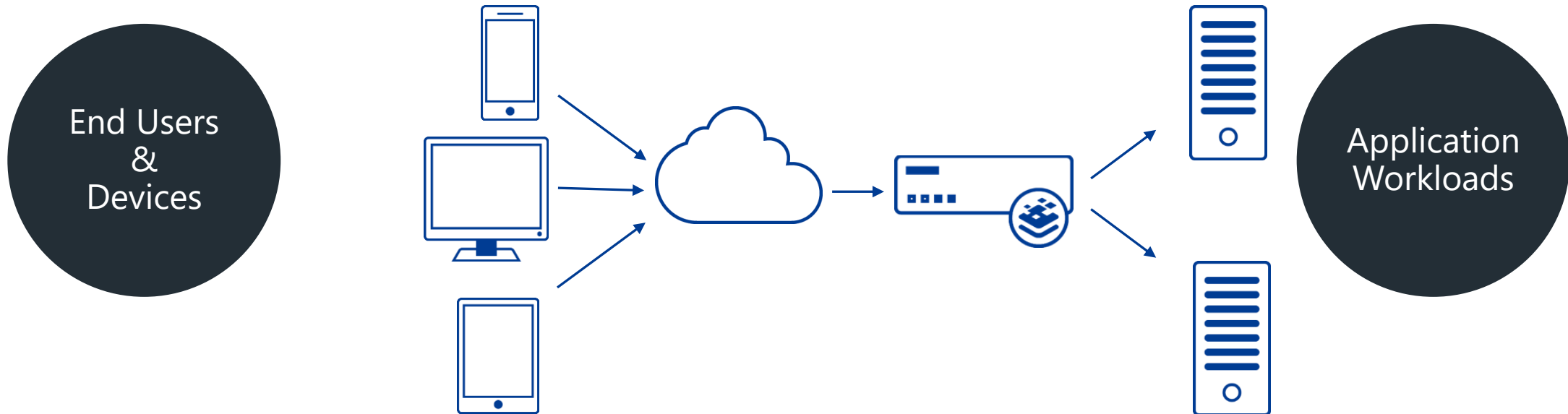
About LoadMaster

❖ What We Do

- ❖ Make applications highly available
- ❖ Improve scalability & performance
- ❖ Secure and optimize application delivery

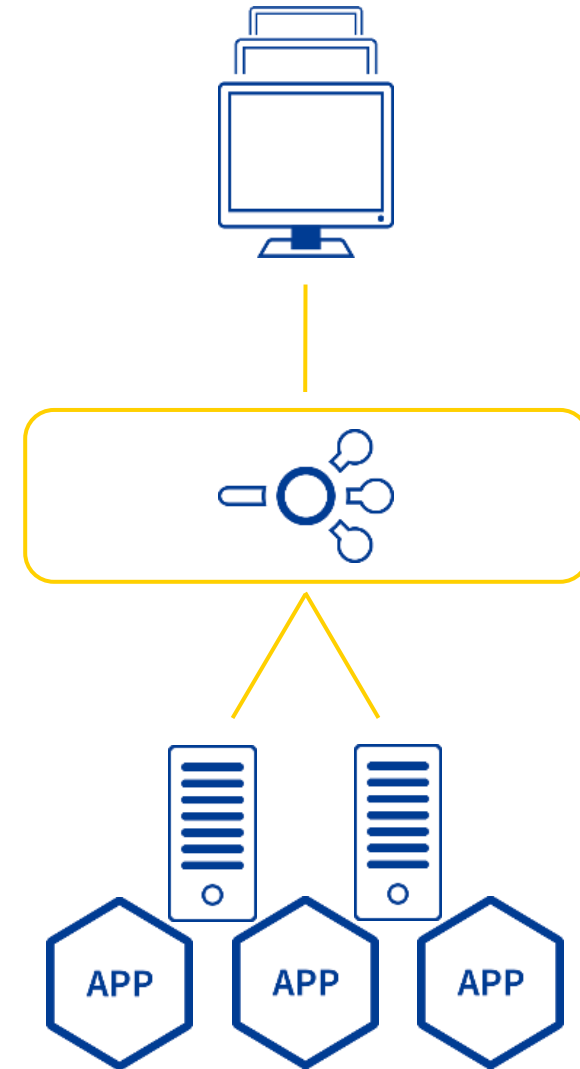
❖ The LoadMaster Difference

- ❖ Application/workload-centric
- ❖ Platform independence/ubiquity
- ❖ Easy to purchase, deploy and use

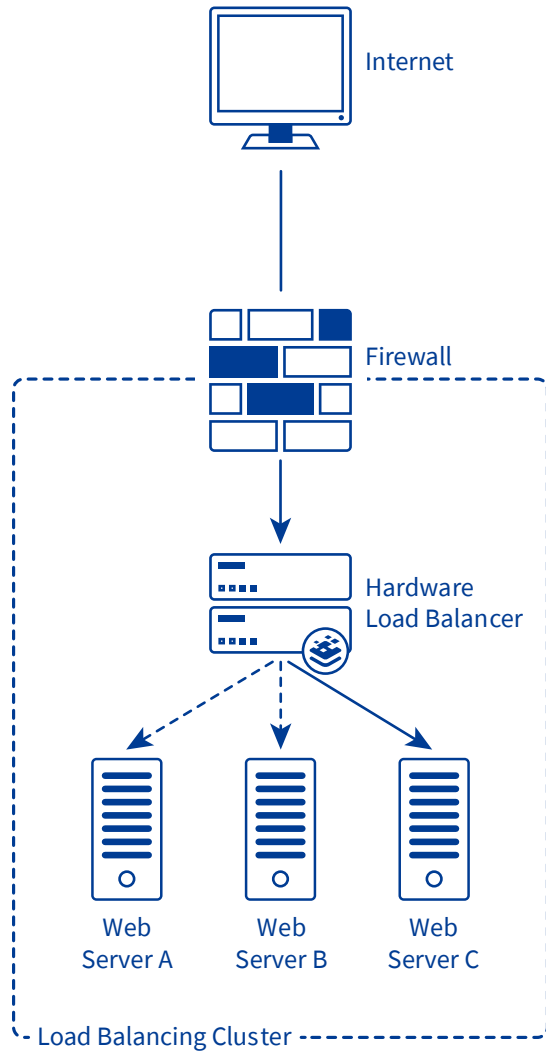


Load Balancing Fundamentals

- ❖ **Server Load Balancing (SLB)**
 - ❖ Reverse proxy managing pools of application servers
 - ❖ Application health checks and distribution algorithms
- ❖ **Global Server Load Balancing (GSLB)**
 - ❖ DNS management for site availability
 - ❖ Site health checks for dynamic DNS responses



Technologies: The Basics of Load balancing



Secure

Authenticate

Persist

Health Check

Load Balance

Application Firewall,
IPS

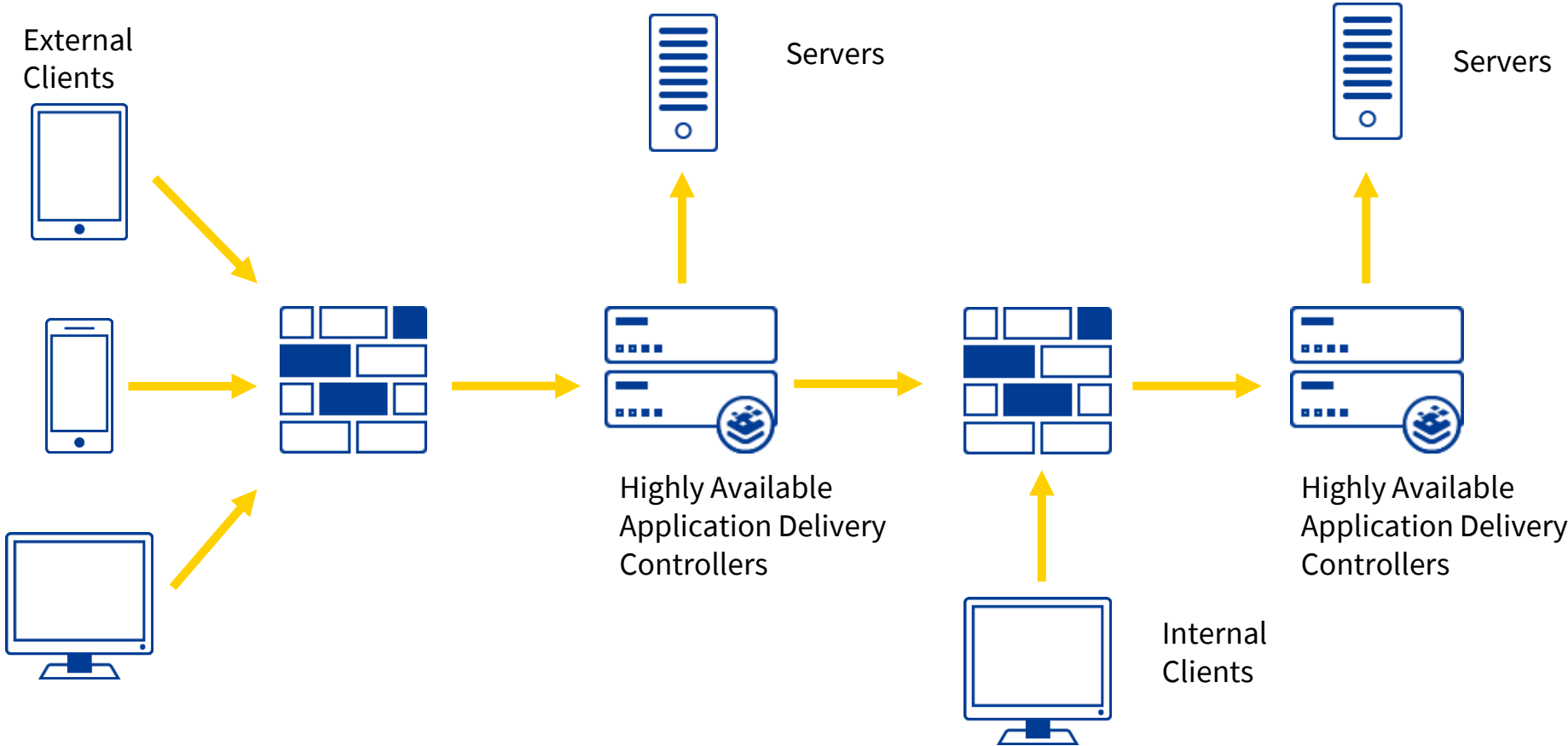
Forms, RADIUS, 2FA,
CAC, KCD

Cookie, Source IP

TCP, UDP,
application

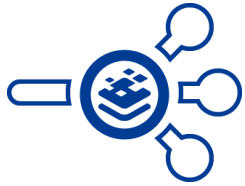
RR, Connection,
Response Time, CR

Load Balancing Sample



Industry's most flexible load balancing options

Virtual Load Balancers



Software load balancing that runs on common hypervisors for cloud and data center infrastructure

Cloud Load Balancers



Cloud-delivered load balancing for public cloud infrastructure including AWS and Azure

Hardware Load Balancers



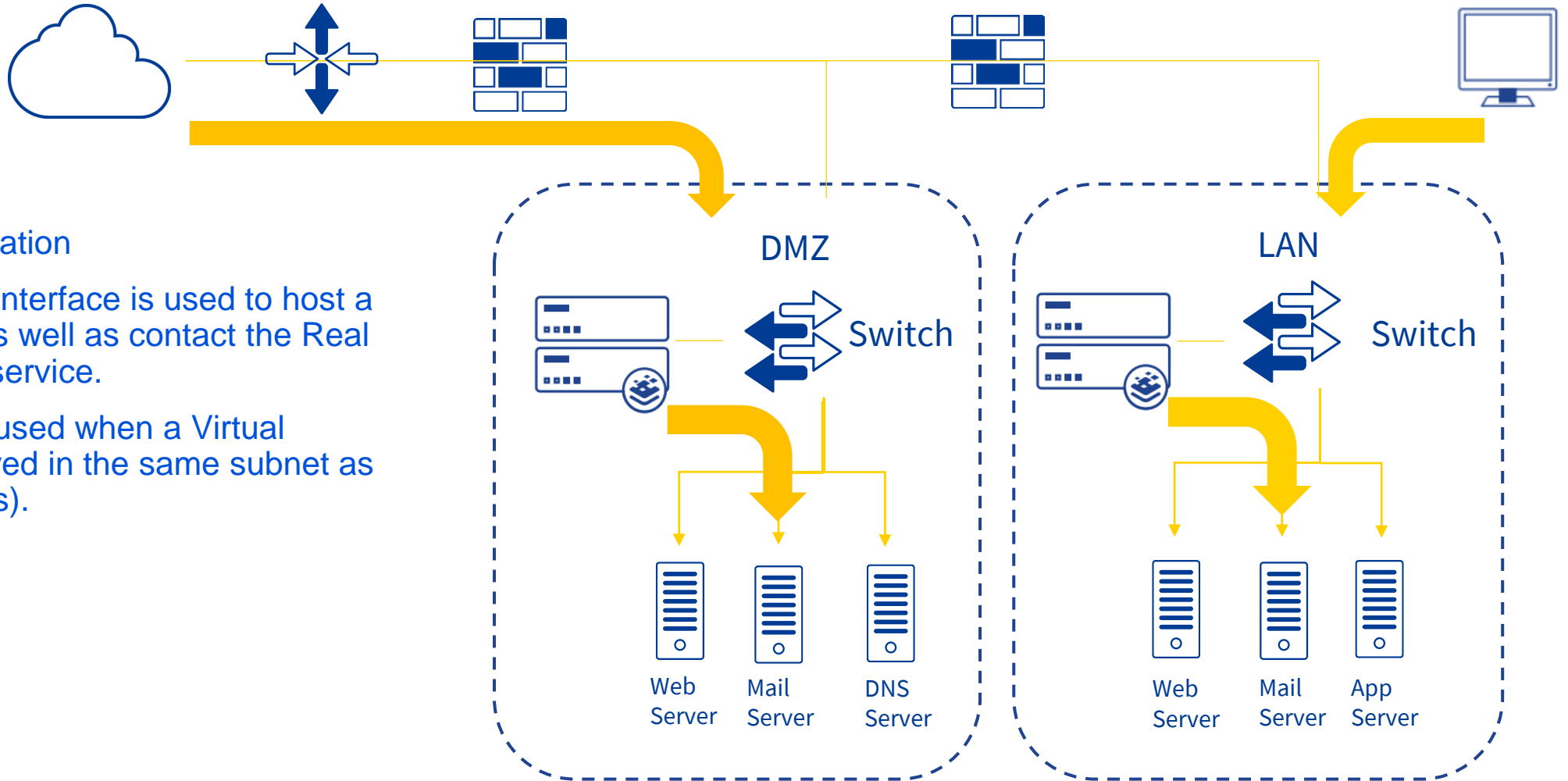
Extensive family of high-performance hardware at unmatched value

Network Topologies

- ❖ In general you can use LoadMaster in a one-arm or two-arm configuration.
- ❖ For each virtual Service (VS) you can decide whether to use 1-arm or 2-arm setup for the service.
- ❖ You can use 1-arm and 2-arm configurations on the same LoadMaster. They can be configured and run at once on the same LoadMaster.



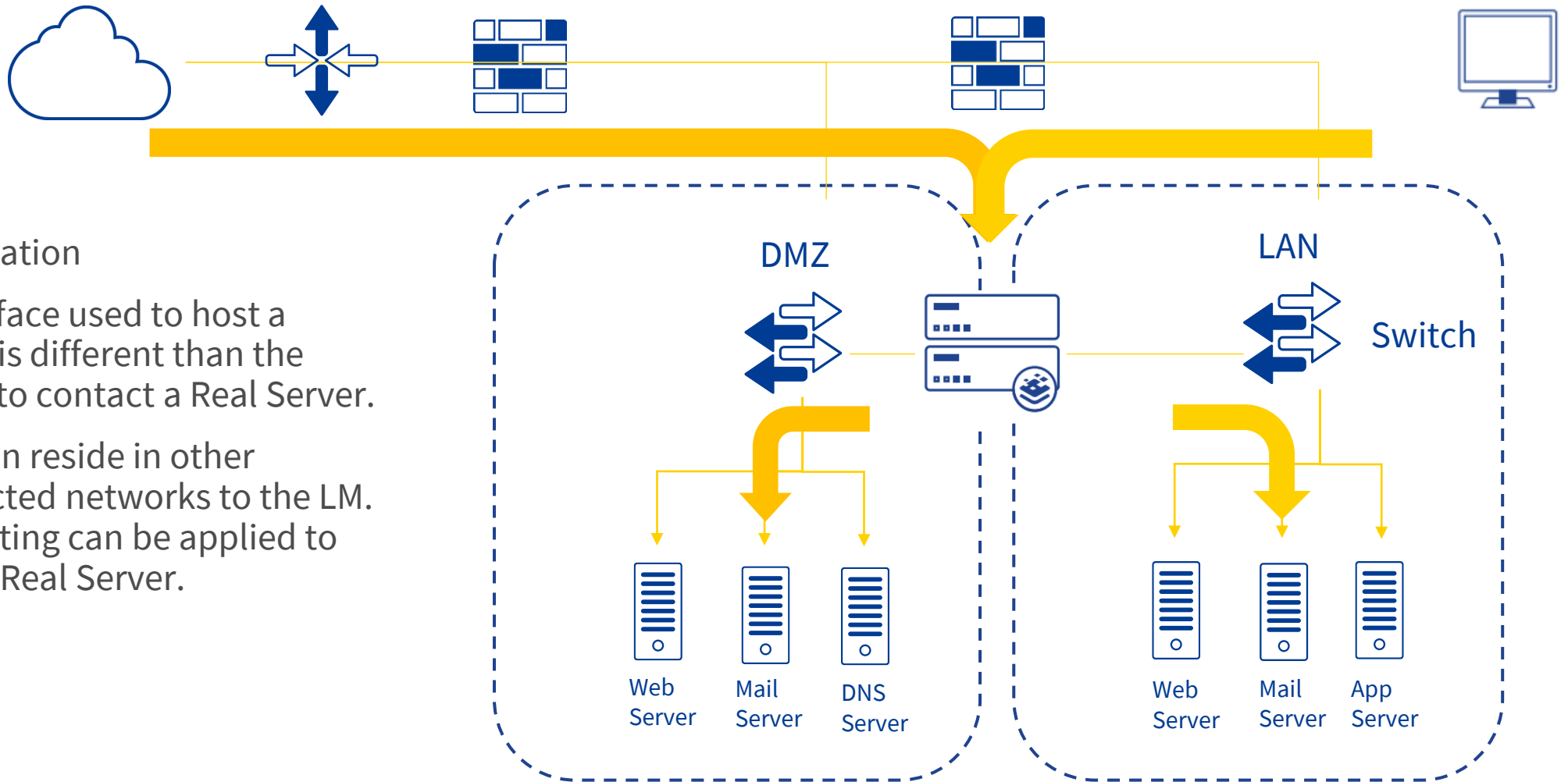
Single Arm Configuration



Single Arm Configuration

- ❖ When the same interface is used to host a Virtual Service as well as contact the Real Servers for that service.
- ❖ Most commonly used when a Virtual Service is deployed in the same subnet as the Real Server(s).

Two Arm Configuration



Two Arm Configuration

- ❖ When the interface used to host a Virtual Service is different than the interface used to contact a Real Server.
- ❖ Real Servers can reside in other directly connected networks to the LM. Alternately routing can be applied to connect to the Real Server.

LoadMaster communication Layer 7 (Transparency and SOR off)



Subnet Originating Request - OFF

▼ Standard Options

Force L4

Transparency

Subnet Originating Requests

Extra Ports

LoadMaster communication Layer 7 (Transparency on)



- ❖ Backend Server sees traffic from client IP
- ❖ LoadMaster Interface IP must be set as default Gateway on the Backend Server
- ❖ Client and Backend have to be on different Networks for this to work

Transparency on

▼ Standard Options	
Force L4	<input checked="" type="checkbox"/>
Transparency	Enabled
Extra Ports	<input type="text"/> Set Extra Ports
Persistence Options	Mode: <input type="text" value="None"/>
Scheduling Method	<input type="text" value="round robin"/>
Use Address for Server NAT	<input type="checkbox"/>

LoadMaster communication Layer 7 with SOR



- ❖ Backend Server sees traffic from the LoadMaster Interface IP
- ❖ Not working with non-local Realservers, Prod traffic than from VIP Address

Subnet Originating Request - ON

The screenshot shows a configuration panel titled 'Standard Options'. It contains the following settings:

- Force L4
- Transparency
- Subnet Originating Requests
- Extra Ports Set Extra Ports

A red arrow points from the text 'Subnet Originating Request - ON' to the checked checkbox for 'Subnet Originating Requests'.

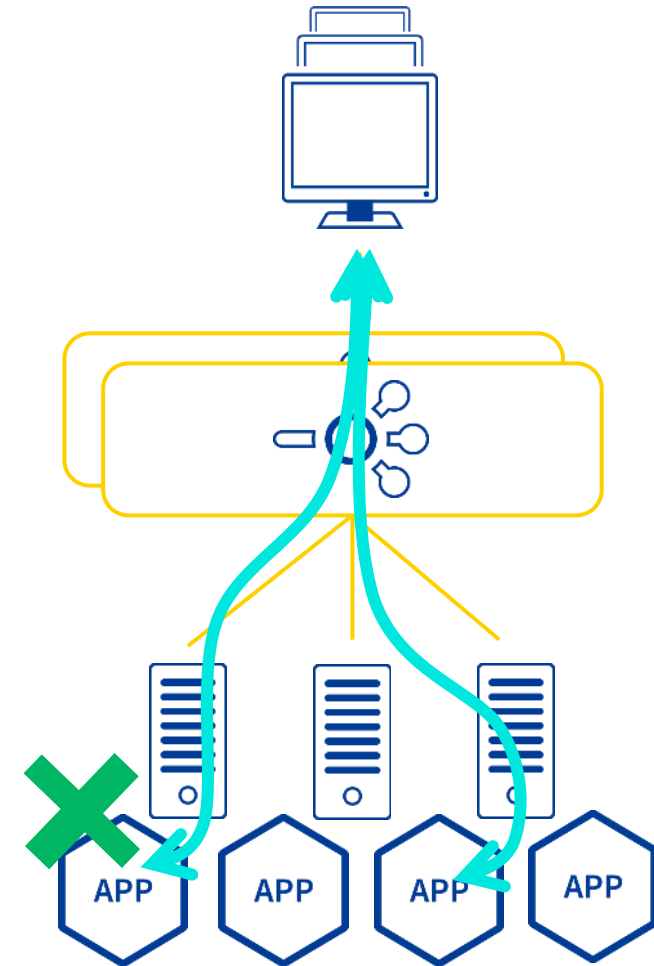
Load Balancing Fundamentals

❖ Server Load Balancing (SLB)

- ❖ Manage server access and availability
- ❖ Access = load balancing methods
- ❖ Availability = health checks

❖ Load balancing methods:

- ❖ Round robin
- ❖ Weighted round robin
- ❖ Least connection
- ❖ Weighted least connection
- ❖ Agent-Based Adaptive Balancing
- ❖ Fixed weighting
- ❖ Weighted response time
- ❖ Source IP hash
- ❖ URL Hash



Question: What does load balancing methods do?

Session Persistence

- ❖ Session Persistence: **Send Returning Client to the same Server**
- ❖ A.k.a. “Session Affinity”, “Sticky Sessions”
- ❖ Based on - Cookies, Source IP, RDP token, Header, ...
- ❖ Port Following - Provides persistence for HTTP and SSL services

Layer 7 / Source IP-based Server Persistence

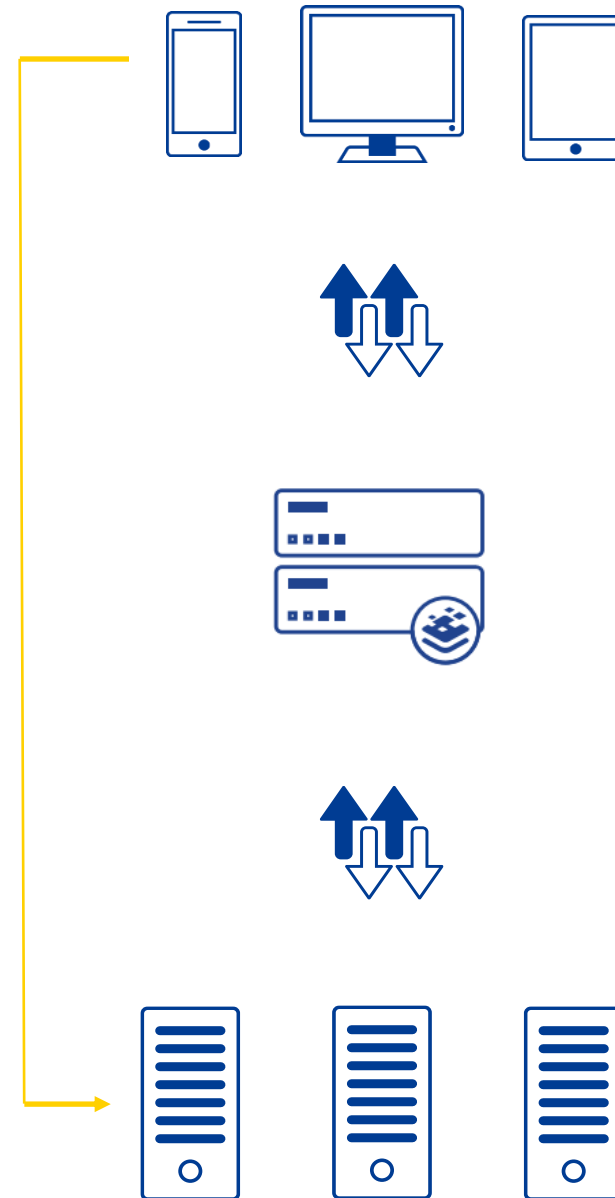
Better: Application Level (L7) Criteria with SSL Offload

*

Examples:

- ❖ Cookie
 - Either using application's cookie or set own ("Active Cookie")
- ❖ Super HTTP (**HTTP Applications**)
 - Multiple HTTP Headers combined
- ❖ URL Hash
 - Same URL
 - = Same Server
- ❖ Hash of HTTP Query Item
 - Same HTTP Request Parameter
 - = Same Server

Fallback to Source IP possible
("...or Source IP")



Shopping Data
For User 1

SSL Offloading

- ❖ Load Balancing of encrypted traffic
- ❖ Or decryption on the Load Master
- ❖ Optional Re-Encryption between LoadMaster and Servers
- ❖ Advantages?

Load Master – Administrative Access

The Administrator WUI Access can be set to a dedicated Interface or be granted to multiple

- ❖ It is important to Set the Default Gateway for the NIC set for the WUI Access

- ❖ **Certificates and Security > Remote Access**

Remote Access

Administrator Access

Allow Remote SSH Access Using: All Networks Port: 22 [Set Port](#)

SSH Pre-Auth Banner [Set Pre-Auth Message](#)

Allow Web Administrative Access Using: eth0: 192.168.100.10 Port: 443

Admin Default Gateway 192.168.100.1 [Set Administrative Access](#)

Allow Multi Interface Access

Enable API Interface Port: via 443 [Set Port](#)

Self-Signed Certificate Handling RSA self-signed certs

Outbound Connection Cipher Set None - Outbound Default

Admin Login Method Password or Client certificate
Only Password mode is available if no Pre-Auth Banner is specified

Enable Software FIPS 140-2 Level 1 Mode [Enable Software FIPS mode](#)

GEO Settings

Remote GEO LoadMaster Access [Set GEO LoadMaster access](#)

GEO LoadMaster Partners [Set GEO LoadMaster Partners](#)

GEO LoadMaster Port 22 [Set GEO LoadMaster Port](#)

GEO Update Interface eth1: 10.0.0.10

[WUI Authorization Options](#)

Load Master: Static Routes

Only use these routes for access to remote real servers, not for client routing

kemp LoadMaster
Additional Routes

Home

- Virtual Services
- Global Balancing
- Statistics
- Real Servers
- Rules & Checking
- Certificates & Security
- System Configuration
 - Network Setup
 - Interfaces
 - eth0
 - bnd1
 - eth2
 - Virtual LAN
 - Host & DNS Configuration
 - Default Gateway
 - Additional Routes**
 - Packet Routing Filter
 - VPN Management
- HA Parameters
- Limiting
- System Administration
- Logging Options
- Miscellaneous Options

Help

Fixed Static Routes

Destination	Gateway	Operation
10.0.30.141	10.1.162.2	Delete
10.1.161.0/24	10.1.162.2	Delete
fd00:0:0:0:0:a01:A23C	fd00::a01:9b0a	Delete

Add New Route

Destination Gateway

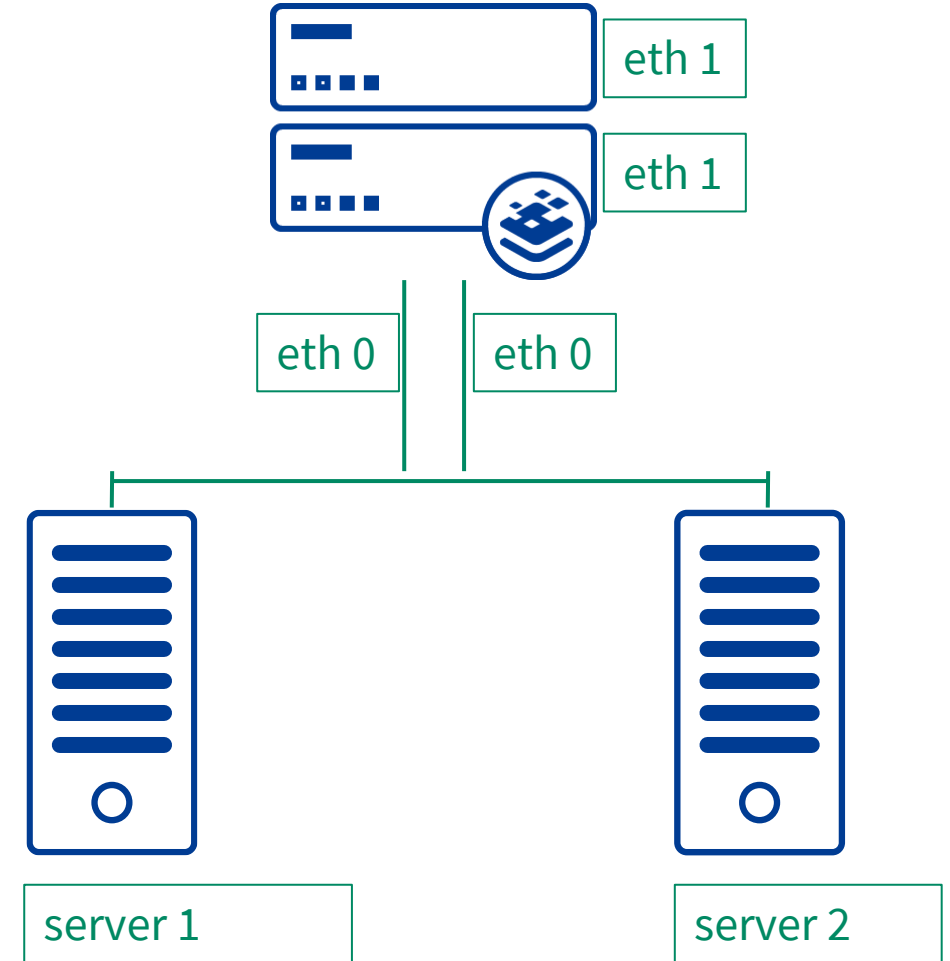
Redundancy.... What are my options?

- ❖ High Availability pair
- ❖ Clustering
- ❖ Geo Partnering



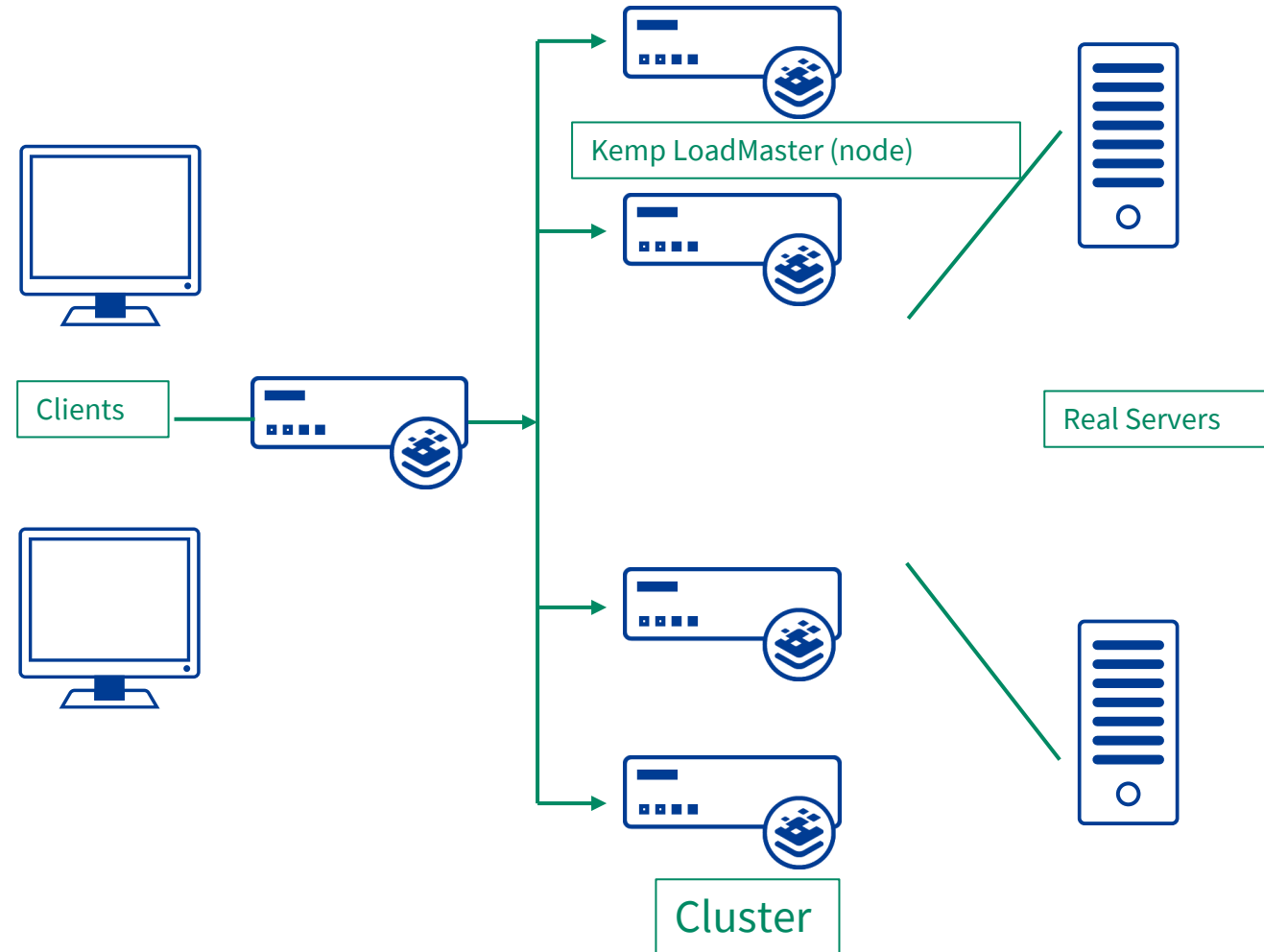
High Availability.....

- ❖ High Availability Pair (Max 2 units)
- ❖ Equivalent products (No Mix+Match)
- ❖ Physical or Virtual Offerings
- ❖ Active/Passive Solution
- ❖ Cost Effective HA Deployment



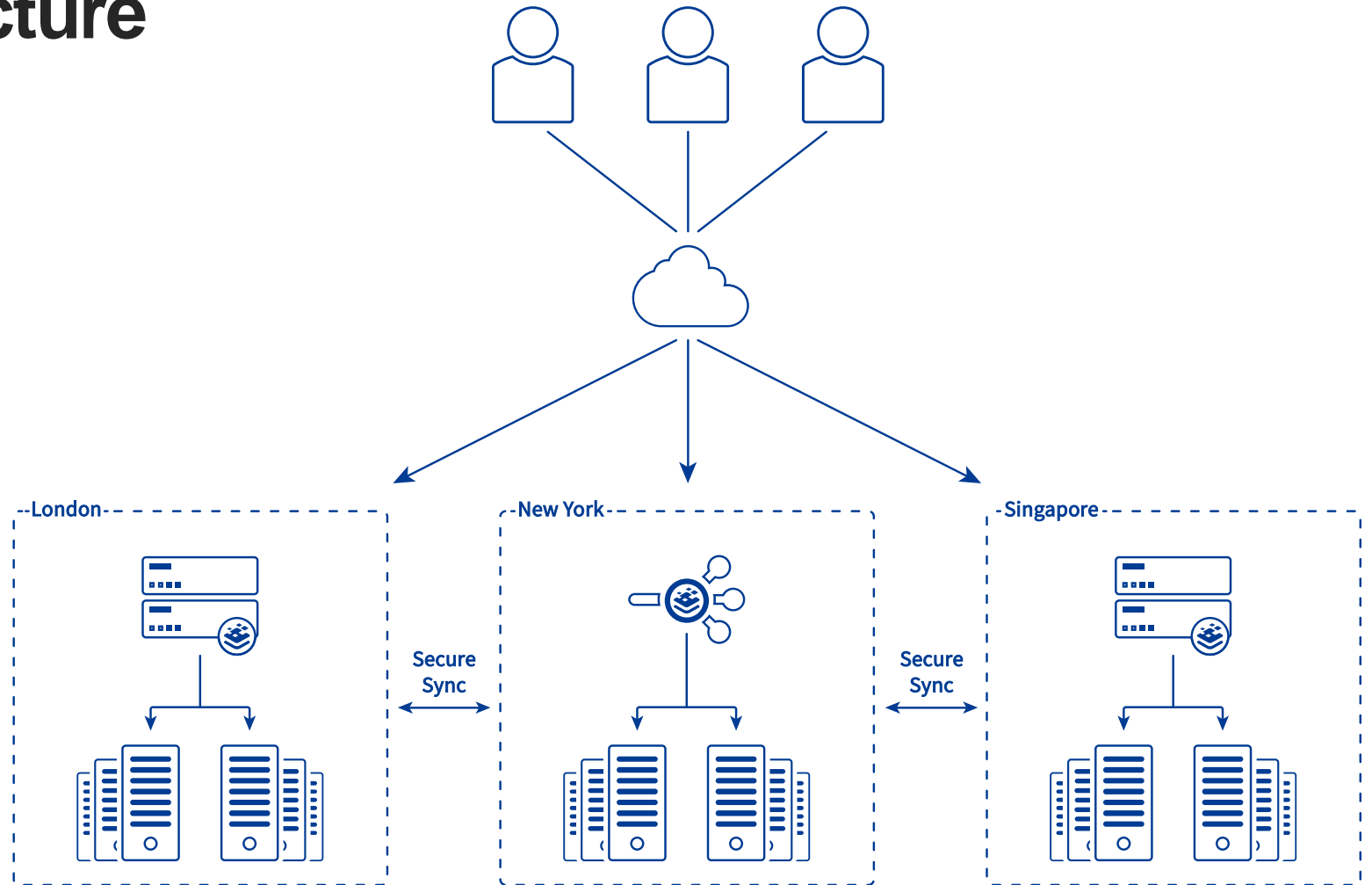
Clustering Options

- ❖ Clustering (min 4 max 16)
- ❖ Equivalent products
- ❖ Physical or Virtual Offerings
- ❖ Scale out – SSL TPS
- ❖ Ideal for linear growth

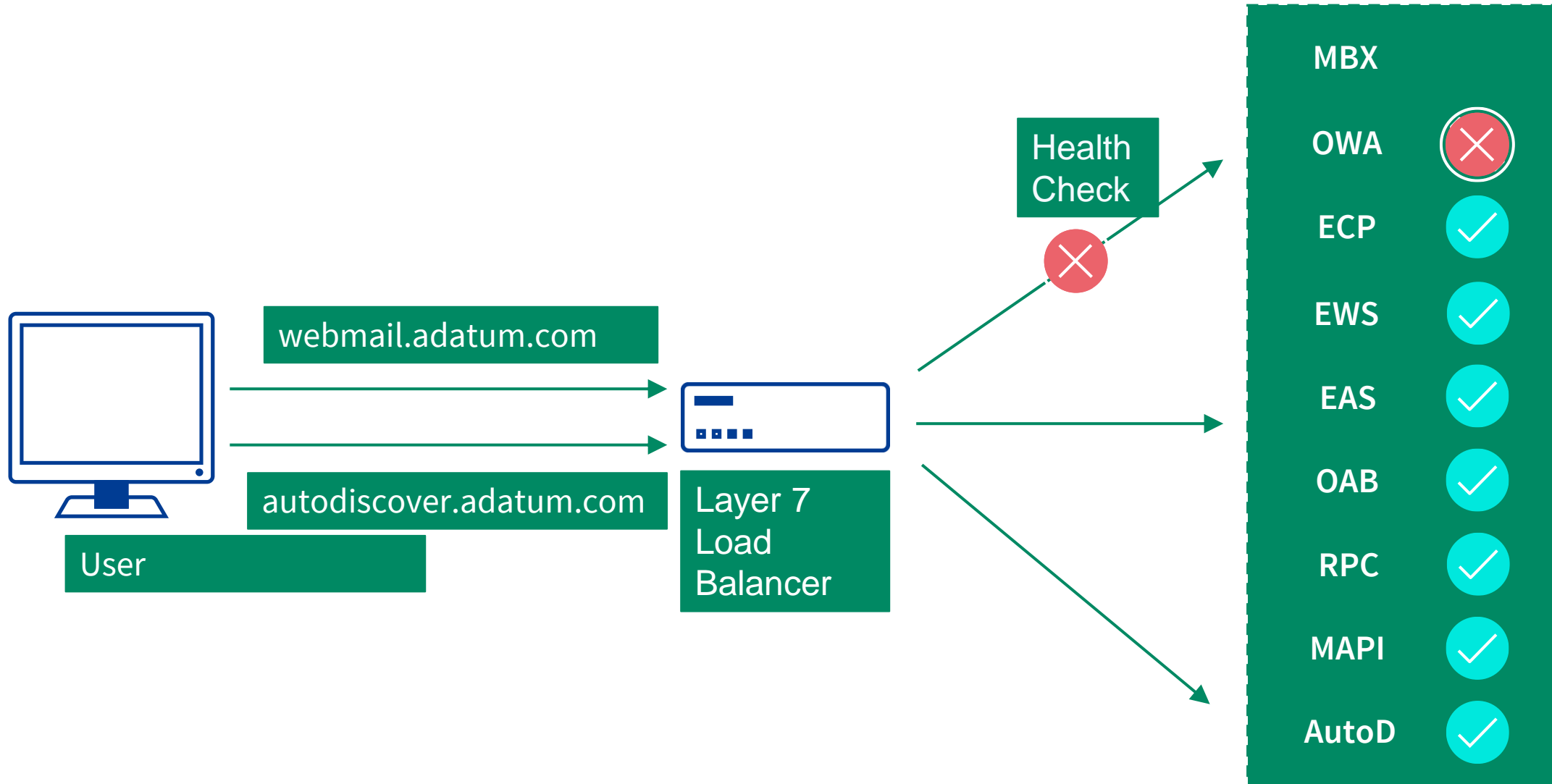


GEO Load Balancing Reference Architecture

- ❖ Multi-Site Load Balancing
- ❖ Geo Location Options
- ❖ Active/Active Offering
- ❖ DNS Based Solution



Example: Layer 7 Load Balancing



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Virtual Services

Virtual Services

Add New

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.0.0.110:80	tcp	Web - intranet.kempdemo.com	L7		Up	APP1.kempdemo.com:8080 APP2.kempdemo.com:8080	Modify Delete

Virtual Service is the term for a load balanced, reverse proxy service hosted on the LoadMaster. Each service or series of services are configured to support a specific application or workload.



- ❖ Clients will connect to the virtual service, rather than their application server or servers. This helps increase application availability.
- ❖ The LoadMaster will determine which server to send each client request to; based on server health checking, advanced scheduling methods and server affinity.

Properties for tcp/10.0.0.110:80 (Id:1) - Operating at Layer 7

<-Back Duplicate VIP Change Address Export Template

Basic Properties

Service Name: Web - intranet.kempdemo.com [Set Nickname]

Alternate Address: [] [Set Alternate Address]

Service Type: HTTP-HTTP/2-HTTPS [v]

Activate or Deactivate Service:

Standard Options

Force L4:

Transparency:

Subnet Originating Requests:

Extra Ports: [] [Set Extra Ports]

Persistence Options Mode: None [v]

Scheduling Method: round robin [v]

Idle Connection Timeout (Default 660): [] [Set Idle Timeout]

Use Address for Server NAT:

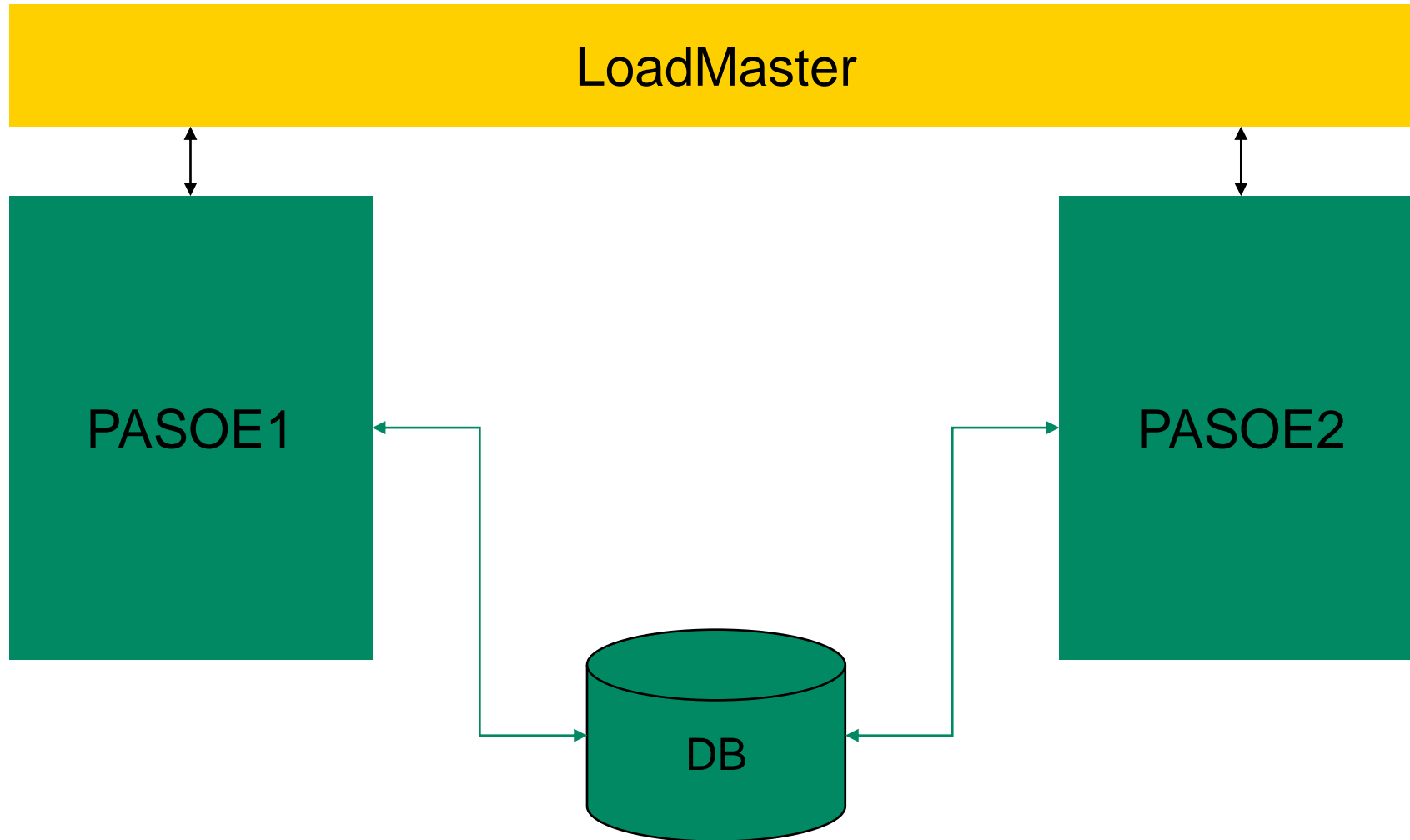
Quality of Service: Normal-Service [v]

Reference: [Feature Description Virtual Services](#)

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Demo

Demo Setup



 = VM met 1 Prod PASOE instance

 = LoadMaster instance



Referenties en documentatie

- Gratis versie LoadMaster
<https://freeloadbalancer.com/>
- [OpenEdge HealthScanner](#)
- [OE en Load Balancing](#)
- [Avoid downtime with PASOE](#)
- [LoadMaster documentatie](#)

